Polluted Runoff Home
Success Stories Home
2002 Stories
1997 Stories
1994 Stories

Washington: Lower Yakima River

Changes in Irrigation Practices Reduce Turbidity

Waterbody | Problem | Project Highlights | Results | Partners & Funding

Waterbody Improved

Erosion from irrigated agricultural lands has caused the waters of the lower Yakima River to become impaired by suspended sediment, turbidity, and the pesticide DDT, causing it to be placed on the state's 303(d) list of impaired waters. As a result of better irrigation practices through the conversion from furrow to sprinkler or drip systems, area farmers have achieved interim total maximum daily load (TMDL) criteria for turbidity at three of the four primary irrigation water return drains, and made significant progress towards meeting TMDL targets at all other sites.

Problem

The Yakima River flows for over 200 miles through south-central Washington, and is one of the most intensively irrigated and agriculturally diverse areas in the United States. The confluence of the Yakima and Naches Rivers (a tributary) at the city of Yakima divides the Yakima River into the "upper" and "lower" portions. During a normal irrigation season at least 300 tons of sediment contaminated with pesticides and other pollutants entered the lower Yakima River from irrigated farmland, interfering with fish and their habitat. Studies have shown that fish in the lower Yakima River have one of the highest concentrations of DDT in the country.

In 1996 the lower Yakima River was placed on Washington's 303(d) list for impairments from suspended sediment, turbidity, and DDT; and in 1998 the Washington State Department of Ecology (Ecology) established a TMDL. Implementation of the TMDL is scheduled over a 20-year time span, with interim targets set at 5-year intervals. The fifth year targets, set for 2002, included meeting the state water quality criterion for turbidity in the mainstem Yakima River, and achieving a maximum 90th percentile turbidity of 25 NTU (nephelometric turbidity units) at the mouths of the four major tributaries in the lower Yakima. Prior to the development of the TMDL, turbidity levels commonly reached 300 NTU or higher.

Top of Page

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Project Highlights

To implement the TMDL a landmark partnership was formed between two irrigation districts in the Yakima Valley—the Sunnyside Valley Irrigation District and the Roza Irrigation District. Under the Roza-Sunnyside Board of Joint Control (Board), the two districts adopted a comprehensive Water Quality Policy, with support and input from local farmers and other landowners, that set specific on-farm turbidity targets. If on-farm targets are not met, the landowner is responsible for taking corrective action by submitting both a short-term and a long-term Water Quality Plan for how the targets will be achieved. If the landowner continues to be in violation of the water quality policies, the Board can reduce water delivery services to the farm until the plan has been implemented and subsequent monitoring indicates compliance. Over 200 plans have been filed with the irrigation districts.

The Board worked closely with many farmers who voluntarily converted well over 20,000 acres from water-intensive and erosive rill and furrow irrigation methods to sprinkler or drip systems to reduce erosion. Each year one lateral irrigation ditch is converted from open ditch to pipe, which reduces evaporation and, in many cases, delivers pressurized water to farms, making it easier for growers to utilize drip and sprinkler systems. Other best management practices implemented to control erosion include the construction of settling ponds, filter strips, and the use of polyacrylamide—a substance that binds to soil while allowing water infiltration.

Top of Page

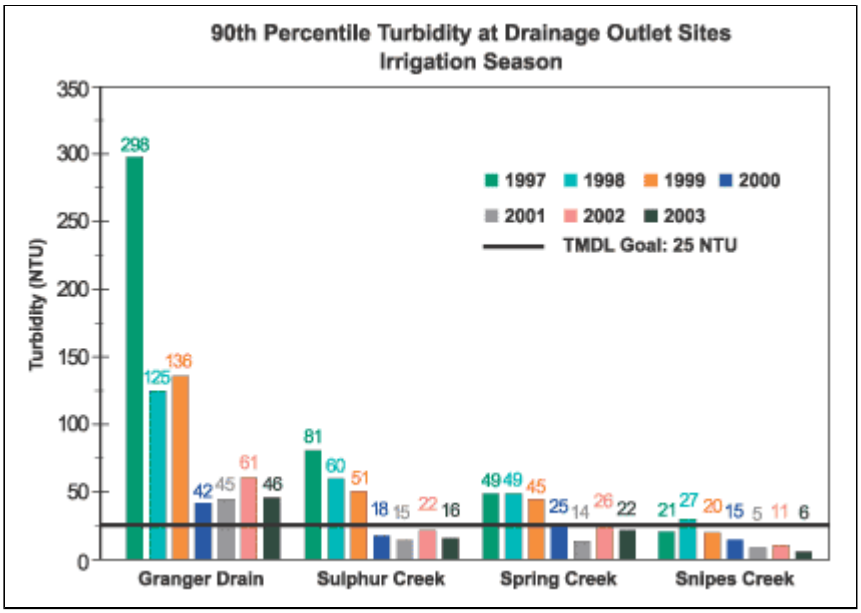
Results

Effectiveness monitoring conducted by Ecology in 2003 shows that three of the four major agricultural drains met the TMDL criteria for turbidity. While the fourth drain did not meet the criteria, it did show a sediment load reduction of approximately 80 percent. Progress was also observed in the mainstem Yakima River, with reductions of total suspended sediment loadings between 50 and 70 percent in 2003 (as compared to 1995).

Partners & Funding

The success of this project is due to support from Ecology, South Yakima Conservation District, North Yakima Conservation District, Yakama Nation, Benton Conservation District, Roza Irrigation District, and Sunnyside Valley Irrigation District. Since 1994, funding has totaled more than $2.5 million. More than $1 million in section 319 funding supported Ecology's work in developing and implementing the TMDL; and approximately $200,000 in section 319 funding supported rill irrigation conversion, water quality monitoring, and other technical assistance. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service provided $2.3 million through the Watershed Protection and Flood Prevention Act (PL-566), along with additional support from USDA's Environmental Quality Incentives Program. Approximately $10 million in low-interest state revolving loan funds from Ecology supported upgrades to irrigation systems. Grants from the U.S. Geological Survey, Yakama Nation, and Washington State University Cooperative Extension Research Station at Prosser funded construction of settling ponds and filter strips. Additional support came from the Washington State Conservation Commission; conservation districts; and the U.S. Department of Interior's Bureau of Reclamation. This funding helped leverage over $6 million from landowners themselves.

Graph represents decreases in turbidity at the four major tributaries in the lower Yakima, with a goal of 25 NTU 90 percent of the time.



Wetlands, Oceans & Watersheds | Watershed Protection | Top of Page

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